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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

PLANT DISEASE SURVEY

Bureau of Plant Industry.

Washington, D. C.

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Estimate of Crop Losses Due to Plant Diseases

1917.

At this time, when especial efforts are being made to increase and conserve the country's food supply, it is particularly desirable to have fundamental information on the factors that reduce the total output of food stuffs. Up to the present no extensive data of a reliable nature have been available on the losses of all important food crops due to plant diseases. Such data are very necessary for the proper direction of pathological work. For this reason, and at the urgent request of the War Emergency Board of American Plant Pathologists, the Plant Disease Survey has gathered the following figures concerning the losses due to plant diseases:

SOURCES OF INFORMATION.

In compiling these data the Survey has utilized all possible sources from which reliable data can be obtained. The chief source of information was the working pathologists throughout the United States, especially the collaborators of the Plant Disease Survey, who were requested to send us as complete and definite estimates of crop losses as possible. This request was sent to all pathologists and botanists who might be in a position to furnish information of this kind and a great many definite estimates were received.

Information was also obtained from county agents on the losses due to the more common diseases of wheat, oats, barley, rye, potatoes and beans

Pathologists of the Bureau of Plant Industry also furnished much valuable information. Credit is due to the following persons for help in the preparation of tables: L. R. Harter, sweet potatoes; M. B. Waite and J. W. Roberts, peaches; L. P. Byars, cotton; H. A. Edson, white potatoes; H. B. Humphrey, cereals. Useful suggestions were received from

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W. A. Orton, C. O. Townsend, A. A. Potter, D. G. Milbrath, G. A. Meckstroth, L. O. Watson, and W. W. Gilbert.

The data obtained from all these sources were combined and on February 19, completed preliminary estimates were sent to collaborators and to pathologists of the Bureau of Plant Industry for their final criticism and revision. All suggested changes were considered in making up the final loss estimates which are presented below and which are believed to be as accurate and as authoritative as can be obtained at this time.

Unless otherwise stated the following tables are based principally on reports of collaborators.

METHODS OF CALCULATING LOSSES.

In these tabulations the losses are expressed in percentages of the total crop and in amount (bushels, pounds, bales, etc.) of reduction in yield due to diseases. No attempt has been made to estimate money loss. Although an accurate estimate of losses due to plant diseases cannot be made, still an approximation is possible. The percentages for the individual states were first determined by utilizing all available figures; reduction in yield was then calculated by considering the production for the year as one hundred per cent minus the percentage of the crop lost by disease. The average estimated percentages of loss for the United States were obtained by dividing the total reduction due to all diseases by the sum of the given production plus the reduction. This method is that followed by the Bureau of Crop Estimates. Figures of production and the order and grouping of states are the same as those used by that Bureau. (Monthly crop report 3: 117-136. 1917.)

The information here given is a bare statement of facts. Little or no attempt has been made to draw conclusions or to interpret results. It is presented in this form in order that it may be made quickly available for use in the work of the coming season.

WHEAT

Estimated probable reduction in yield of wheat due to Bunt (*Tilletia* spp.), Loose Smut (*Ustilago tritici*), Rusts (*Puccinia graminis*, *P. triticina*, and *P. glumarum*), and Scab (*Fusarium culmorum*), during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield due to diseases							
		Bunt		Loose Smut		Rusts		Scab	
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
Maine	154	4	6			3	5		
Vermont	60	5	3			3	2		
New York	8,385	1	85	.75	63				
New Jersey	1,691					1	17		
Pennsylvania	24,482	1	247	2.5	628	3	758		
Delaware	2,162	3	67	3	67	.5	11	2	44
Maryland	11,475	1.3	151	5	604	5	604	4	478
Virginia	17,920	5	943	5	943	1.5	273		
West Virginia	4,410	4	184	3	136			1.5	67
North Carolina	9,765	5	514	5	514	8	849		
South Carolina	1,838			5	97	7	138		
Georgia	2,074	6	132	2.5	53	8	180		
Ohio	41,140	1	416	2	840			8	3,577
Indiana	33,392	2	681	2	681	5.4	1,905	7	2,513
Illinois	30,400	3	941	3	941	5	1,600	7	2,288
Michigan	15,210	5	801	2	310	6	971		
Wisconsin	5,327	1.5	81	1	54	1	54		
Minnesota	57,965	1.75	1,031	.75	438	.5	291	1	586
Iowa	8,350	.5	42	2	190	.5	47	4	390
Missouri	27,540	4	1,148	1.5	419	2	562		
North Dakota	56,000	1	566	.75	423	5	2,947		
South Dakota	52,024	2	1,062	2	1,062	4	2,168		
Nebraska	13,764	4	569	.5	69	2	281		
Kansas	45,394	3	1,404	.75	347	1	463		

Kentucky	9,000	3	278	3	278	5	474	7	677
Tennessee	4,830	3	149	3	149	10	530		
Alabama	930	6	59	2.5	24	2	19		
Mississippi	210	7	16	2.5	5	2	4		
Texas	16,200	5	853	2	331	1	163		
Oklahoma	35,650	7	2,783	3	1,102	1	360		
Arkansas	3,360	6.5	234	2.5	86	3	104		
Montana	17,963	3.5	652	.5	90	.25	45		
Wyoming	4,206	2	86	1.25	55	0	0		
Colorado	13,536	7	1,019	1.5	206	0	0		
New Mexico	2,582	7	194	3	80	0	0		
Arizona	825	2.5	21	1.5	13	2	17		
Utah	5,650	6	361	1.5	86	0	0		
Nevada	1,140	4	47	1.5	17	0	0		
Idaho	13,830	10	1,537	2.5	355	2	282		
Washington	29,218	5	1,538	.1	29	.1	29		
Oregon	12,811	4	534	.1	13	.1	13		
California	7,425	7	559	.5	37	5	37		
United States	650,828	3.08	21,994	1.66	11,835	2.27	16,203	1.49	10,620*
Other diseases, United States								.5	3,575
Total reduction due to disease, United States								9.	64,227

*Total for states reporting. Reports have been received of the occurrence of scab in other states but on account of lack of definite information figures are not available.

The low percentage of loss from Bunt in Washington and Oregon is because of the fact that a great amount of spring wheat was planted in 1917. For winter wheat the approximate average reduction would be from 10 to 15% in these states.

Cereal rusts caused much less damage this year than is often the case. The great wheat states escaped with practically no damage. The disease was most serious in some of the middle and south Atlantic states.

RYE

Estimated reduction in yield of rye due to ergot (*Claviceps purpurea*) during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield %	Reduction in yield Bushels 000 omitted
Indiana	3,000	2	61
Illinois	752	.5	4
Michigan	5,115	2	104
Wisconsin	7,585	.5	38
Minnesota	7,585	2	155
Iowa	900	3	28
North Dakota	9,880	4	412
South Dakota	5,600	2	114
Other States	19,728	1	199
United States	60,145	1.77	1,115
Reduction due to smut		.75	471
Reduction due to rusts		.75	471
Reduction due to other diseases		1.	628
Total reduction due to diseases, United States		4.27	2,685

Smut caused by *Urocystis occulta* is reported as follows: Michigan about 1%; Wisconsin, small; Minnesota 3.8%; Iowa about .2%; Pennsylvania 2%; New York, slight. Although the damage caused by this disease is very indefinite, it is probable that .75% or 475,000 bushels of the rye crop is destroyed.

Rusts due to various species of *Puccinia* reduced the yield considerable in some places as follows: North Dakota 4%; North Carolina 15%; South Carolina 2%, and slight to none in other states. An estimate of .75% or 475,000 bushels is made for the United States.

Other diseases of more or less importance in 1917 were anthracnose caused by *Colletotrichum cereale*, scab caused by *Fusarium culmorum*, and powdery mildew caused by *Erysiphe graminis*. 1% or 633,000 bushels is a rough estimate of the amount of loss caused by these diseases.

BARLEY

Estimated reduction in yield of barley due to the smut diseases caused by *Ustilago nuda* and *Ustilago hordei*, 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield	
		%	Bushels 000 omitted
Maine	147	2	3
Vermont	483	3	15
New York	3,000	5	162
Pennsylvania	364	3	11
Indiana	671	3.5	24
Illinois	2,475	3	77
Michigan	3,445	3	107
Wisconsin	19,200	3	594
Minnesota	37,300	1.5	576
Iowa	10,500	1.5	160
Missouri	150	2	3
North Dakota	22,812	3	706
South Dakota	26,520	5	1,396
Kansas	7,500	6.5	521
Texas	180	3	6
Montana	1,350	1	14
Wyoming	783	4.5	37
Colorado	5,544	1.5	84
New Mexico	364	2	7
Arizona	1,155	2	24
Idaho	5,510	3	170
Oregon	5,278	3	163
California	39,150	5	2,061
All other states probably	14,504	3.1	464
United States	208,975	3.34	7,385
Reduction due to stripe		1	2,212
Reduction due to rusts		.9	1,991
Reduction due to net blotch and spot blotch		.3	664
Total reduction due to diseases, United States		5.54	12,252

BARLEY (Continued)

The stripe disease of barley caused by *Helminthosporium gramineum* ranks next to the smuts in importance and probably causes a loss of about 1% or 2,212,000 bushels, most of which occurs in the chief barley producing states. In Iowa 4% damage is reported and in Wisconsin 2%, while in Minnesota, North Dakota, South Dakota and Nebraska a considerable reduction in yield is recorded as having taken place.

Stem rust caused by *Puccinia graminis* and leaf rust caused by *P. simplex* were somewhat less serious than usual, but in spite of this the loss for the United States aggregates about .9% of the crop or 1,997,000 bushels.

Other diseases of importance are net blotch and spot blotch caused by *Helminthosporium teres* and *H. sativum* respectively. These occur in moderate amounts in the barley growing region of the middle west and probably reduce the crop at least .3% or 665,000 bushels.

OATS

Estimated reduction in yield of oats due to smuts (*Ustilago avenae* and U. levis), and rusts (*Puccinia graminis*, *P. coronata*), during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield due to disease			
		Smuts		Rusts	
		%	000 omitted	%	Bushels 000 omitted
Maine	4,930	5	259	6	315
New Hampshire	532	6	34	6	34
Vermont	3,168	6	202	3	98
Massachusetts	444	3	14	4	19
Rhode Island	62	10	7	5	3
Connecticut	660	1.25	8	.75	5
New York	44,625	5	2,349	.5	224
Pennsylvania	41,125	5	2,164	2	839
Delaware	127	2.5	3	1	1
Maryland	1,457	5	76	3	45
Virginia	5,512	8	479	5	290
West Virginia	3,861	7.5	313	3	119
North Carolina	5,780	6	368	6	368
South Carolina	6,000	10	666	2	122
Georgia	10,400	6	663	5	547
Florida	770	10	86	8	66
Ohio	78,100	4	3,254	.5	392
Indiana	76,440	10	8,493	1	772
Illinois	244,400	7	18,395	3.25	8,210

Michigan	56,575	8	4,920	5	2,978
Wisconsin	99,000	3	3,062	1	1,000
Minnesota	120,250	3	3,719	.5	604
Iowa	246,750	4	10,281	.5	1,240
Missouri	59,200	7	4,456	1	608
North Dakota	38,625	4	1,609	1	390
South Dakota	65,450	6	4,177	1	661
Nebraska	115,444	6	7,369	1.5	1,758
Kansas	70,804	4	2,950	2	1,445
Tennessee	7,350	6	469	4	306
Alabama	9,720	6	620	3	301
Mississippi	5,700	7	428	5	300
Louisiana	1,873	10	208	5	99
Texas	37,050	5	1,950	2	756
Oklahoma	26,450	3	818	3	818
Arkansas	9,520	2	194	1	96
Montana	13,600	2	278	.5	68
Colorado	11,134	6	711	.25	28
New Mexico	1,350	10	150	.25	3
Arizona	400	10	44	.25	1
Utah	4,400	5	232	.25	11
Nevada	560	2	11	.25	1
Idaho	10,450	6	667	.25	26
Washington	11,242	3	348	.25	28
Oregon	9,125	3	282	.25	23
California	6,860	4	286	2	140
All other states	62,646	5.4	3,576	2.1	1,344
United States	1,587,286	5.26	91,648	1.58	27,502
Other diseases, United States				2	34,825
Total loss due to diseases, United States				8.84	154,120

The rusts of oats, like the other cereal rusts, were more prevalent in the eastern than in the western states, largely on account of the fact that moisture conditions were more favorable for infection.

CORN

Estimated reduction in yield of corn due to smut (Ustilago zeae), during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield %	Reduction in yield Bushels 000 omitted
Maine	780	.1	1
New Hampshire	1,092	1	11
Vermont	2,538	1	26
Massachusetts	2,806	1	28
Rhode Island	546	.25	1
Connecticut	4,845	.25	12
New York	26,040	1	263
New Jersey	12,771	1	129
Pennsylvania	62,212	1	628
Delaware	7,820	2	160
Maryland	28,080	1	284
Virginia	72,275	2	1,475
West Virginia	25,020	5	1,317
North Carolina	60,000	3	1,856
South Carolina	43,947	5	2,313
Georgia	72,000	2.5	1,846
Florida	13,875	2	283
Ohio	150,100	4	6,254
Indiana	203,436	4	8,476
Illinois	418,000	2	8,531
Michigan	37,625	3	1,167
Wisconsin	42,196	.5	212
Minnesota	90,000	.6	600
Iowa	410,700	3	12,702
Missouri	252,000	2	5,143
North Dakota	5,310	2	108
South Dakota	97,150	5	5,113
Nebraska	249,480	6	15,924
Kansas	128,184	8	11,144
Kentucky	122,850	5	6,466
Tennessee	111,150	5	5,850
Alabama	77,200	1.5	1,176
Mississippi	81,050	1	819
Louisiana	42,246	2	862
Texas	77,825	4	3,241
Oklahoma	33,150	8	2,882
Arkansas	67,200	1	679

CORN (Continued)

Montana	1,012	1	10
Wyoming	660	1	7
Colorado	10,640	3	329
New Mexico	3,400	8	296
Arizona	864	3	26
Utah	500	.5	3
Nevada	60	.5	-
Idaho	682	.5	3
Washington	1,517	.1	2
Oregon	1,260	.1	1
California	2,400	.5	12
United States	3,159,494	3.26	108,671
Other diseases, United States		2	66,697
Total loss due to disease, United States		5.26	175,368

Corn smut, during the season of 1917, was most severe in the western part of the corn belt. The reduction in yield due to the disease was comparatively low in other corn growing regions.

Corn rust caused by *Puccinia sorghi* was more or less prevalent, particularly in the South. The disease is reported as being severe in Arkansas, Alabama, Tennessee, South Carolina and Louisiana, causing an average loss of approximately 5,261,000 bushels or 1.52% of the crop in these particular states.

Other corn diseases, while not so important as the smut, have added to the losses of the crop. Reports indicate that the ear rots of corn caused by *Diplodia zeae* and *Fusarium* sp. were prevalent and destructive in Delaware, Illinois, Iowa, Ohio, and Tennessee, the Gulf Coast and south Atlantic states. The corn root disease is reported as severe in Indiana and Illinois.

Wilt caused by *Bacterium stewartii* and stripe caused by *Helminthosporium* are also reported as causing rather serious damage in a few states.

The losses from Physoderma are not included under other diseases.

POTATO

Estimated reduction in yield of potatoes due to late blight (*Phytophthora infestans*) and wilt (*Fusarium oxysporum*), during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield due to disease: Late Blight and Rot %	Late Blight and Rot Bushels 000 omitted	Fusarium Wilt %	Fusarium Wilt Bushels 000 omitted
Maine	20,250	25	6,750	0	0
New Hampshire	2,247	15	396	0	0
Vermont	3,000	17	614	0	0
Massachusetts	4,370	10	486	.2	9
Rhode Island	675	22	189	.5	3
Connecticut	3,190	5	168	0	0
New York	38,000	10	4,220	2	776
New Jersey	11,172	.5	56	.5	56
Pennsylvania	29,532	18	6,403	5	1,554
Delaware	1,235	2	25	2	25
Maryland	6,000	10	666	5	316
Virginia	19,800	.5	99	4	825
West Virginia	7,475	15	1,319	6	477
North Carolina	4,500	8	391	4	188
South Carolina	1,440	6	92	6	92
Georgia	1,596	6	102	.1	2
Florida	2,275	8	198	.1	2
Ohio	16,000	4	666	6	1,021
Indiana	8,464	.5	43	6	540
Illinois	13,500	.5	68	6	862
Michigan	35,910	.5	180	15	6,337
Wisconsin	34,998	0	0	1	354
Minnesota	33,600	.1	34	1	339
Iowa	13,110	.1	13	1	132
Missouri	9,483	0	0	1.5	144
North Dakota	3,870	0	0	10	430
South Dakota	7,200	0	0	10	800
Nebraska	12,495	0	0	5	658
Kansas	4,446	0	0	5	234
Kentucky	6,720	2	137	1.5	102
Tennessee	4,888	1.5	74	1.5	74
Alabama	2,952	6	188	.1	3
Mississippi	1,092	4	46	.1	1
Louisiana	1,600	0	0	0	0

Texas	2,760	0	0	10	307
Oklahoma	2,484	0	0	1	25
Arkansas	2,400	0	0	2	49
Montana	5,415	0	0	3	167
Wyoming	4,650	0	0	10	517
Colorado	9,310	0	0	15	1,643
New Mexico	1,276	0	0	12	174
Arizona	420	0	0	10	47
Utah	4,347	0	0	20	1,087
Nevada	3,105	0	0	15	548
Idaho	6,084	0	0	30	2,607
Washington	9,875	8	859	1	100
Oregon	8,100	.5	41	1	82
California	15,225	0	0	10	1,691
United States	442,536	4.39	24,603	4.54	25,400
Other Diseases, United States				12	67,164
Total loss due to disease, United States				20.93	117,167

Late blight was most severe this year in New England and the middle Atlantic states. It occurred also in isolated areas in northern states as far west as Minnesota and Iowa but in this region did no serious damage. Considerable damage to the spring crop early in the season was reported from the south Atlantic and Gulf states.

Fusarium wilt caused slightly more loss than late blight in the country as a whole, although most of the injury took place in a different set of states, namely, those between the Rocky Mountains and the Missouri River.

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BEAN

Estimated reduction in yield of dry, edible beans due to anthracnose (*Colletotrichum lindemuthianum*) and bacterial blight (*Bacterium phaseoli*), during the season of 1917.

State	Production 1917 Bushels 000 omitted	Reduction in yield due to diseases			
		Anthracnose		Blight	
		%	Bushels 000 omitted	%	Bushels 000 omitted
Maine	330	25	110	0	0
New Hampshire	100	5	5	1.5	2
Vermont	100	10	11	2	2
Massachusetts	40	5	2	.5	-
New York	1,575	5	83	8	137
New Jersey	80	6	5	1	1
Pennsylvania	104	10	12	8	9
West Virginia	144	5	7	3	4
Ohio	35	5	2	3	1
Indiana	60	3	2	4	3
Michigan	3,515	1	36	5	185
Wisconsin	262	1	3	2	5
Iowa	42	5	2	3	1
Missouri	92	4	4	3	3
Tennessee	60	10	7	4	2
Colorado	1,467	0	0	6	94
New Mexico	958	2	20	2	20
Arizona	152	2	3	2	3
Washington	128	0	0	0	0
California	8,035	0	0	0	0
All other states probably	850	5.5	49	4.5	40
United States	18,129	1.76	363	2.48	512
Other diseases, United States				9	1,653
Total loss due to disease, United States				12.24	2,528

These estimates of losses do not include those caused by various diseases to the snap beans grown in several of the Southern states. No data were available for a report on losses to snap beans, although it is very probable that these losses are severe.

SWEET POTATO

Estimated reduction in yield of sweet potatoes due to stem rot (*Fusarium hyperoxysporum* and *F. batatatis*), black rot (*Sphaeronema fimbriatum*), and storage rots caused by various other organisms, during the season of 1917.

(Table based largely on data from Office of Cotton & Truck Disease Investigations)

State	Production 1917 Bushels 000 omitted	Reduction in yield due to diseases					
		Stem Rot		Black Rot		Storage Rots	
		%	Bushels 000 omitted	%	Bushels 000 omitted	%	Bushels 000 omitted
New Jersey	2,880	10	320	5	152	20	720
Pennsylvania	110	0	0	2	2	0	0
Delaware	560	5	29	5	29	15	99
Maryland	1,180	5	62	8	103	15	208
Virginia	4,160	3	129	4	173	15	734
West Virginia	280	0	0	2	6	0	0
North Carolina	8,550	2	174	7	644	30	3,664
South Carolina	7,600	2	155	7	572	30	3,257
Georgia	11,625	2	237	5	612	30	4,982
Florida	3,500	2.5	90	1	35	1	35
Ohio	95	2	2	2	2	0	0
Indiana	318	0	0	2	6	0	0
Illinois	776	2	16	4	32	5	41
Iowa	270	5	14	5	14	0	0
Missouri	896	1	9	2	19	0	0
Kansas	368	2.5	9	2.5	9	10	41
Kentucky	1,140	0	0	0	0	25	380
Tennessee	2,850	0	0	15	503	25	950
Alabama	16,020	2	327	8	1,393	30	6,865
Mississippi	5,525	2	113	8	480	30	2,368
Louisiana	4,898	0	0	4	204	30	2,099
Texas	6,552	1	66	5	345	30	2,808
Oklahoma	1,350	2	28	4	56	30	578
Arkansas	4,400	2	90	3	136	30	1,886
New Mexico	236	0	0	10	26	0	0
California	1,002	2	20	6	64	0	0
United States	87,141	1.47	1,890	4.36	5,617	24.6	31,715
Other diseases, United States						1.94	2,484
Total loss due to disease, United States						32.37	41,706

SWEET POTATO (Continued)

The table on sweet potatoes was prepared with the aid of L. L. Harter who supplied a large part of the data. The estimates of losses from black rot include injury both in field and in storage. The figures on storage rots do not include losses from black rot.

The other diseases mentioned as causing losses are foot rot (*Plenodomus destruens*), root rot (*Ozonium omnivorum*), and root knot (*Heterodera radicicola*). It is believed that the leaf spots, white rust, scurf, and certain other minor troubles are not factors in materially reducing the yield of the crop and so are not considered.

COTTON

Estimated reduction in yield of lint cotton due to wilt (*Fusarium vasinfectum*), anthracnose (*Colletotrichum gossypii*) and root knot (*Heterodera radicicola*) during the season 1917.

(Table based largely on data from Office of Cotton & Truck Disease Investigations)

State	Production 1917 Bales 000 omitted	Reduction in yield due to disease					
		Wilt		Anthracnose		Root Knot	
		%	Bales 000 omitted	%	Bales 000 omitted	%	Bales 000 omitted
North Carolina	570	4	24	5	30	2.8	16
South Carolina	1,235	3	38	4	51	4.1	53
Georgia	1,820	4.8	92	5	96	4.1	78
Florida	40	2.5	1	5.5	2	3.5	1
Alabama	505	4.5	24	3	16	3.5	18
Mississippi	895	3	28	4	37	2.8	26
Louisiana	615	2	13	4	26	2.8	18
Texas	3,115	1	31	2	64	.7	22
Arkansas	895	4	37	2	18	2.8	26
Tennessee	206	1	2	3	6	.7	1
Oklahoma	890	1	9	2	18	.7	6
Other States	163						
United States	10,949	2.3	299	2.84	364	2.07	265
Other diseases, including malnutrition troubles, angular leaf spot and Diplodia boll rot, United States						7.3	938
Total loss from all diseases, United States.						14.5	1,866

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COTTON (Continued)

The preceding figures express losses of lint cotton in terms of bales of 500 pounds each. It should be remembered that for every bale of lint there is a corresponding reduction of about 1000 pounds of seed.

The estimates on root knot were obtained in collaboration with L. P. Byars of the Office of Cotton and Truck Disease Investigations and are based on a survey carried on in 1916.

Reduction in yield from so-called potash hunger is included with other diseases and constitutes the greater part of the loss. The figures on this trouble are based largely on a survey of cotton fields during the past season by scouts of the Plant Disease Survey.

SUGAR BEET

Estimated reduction in yield of sugar beets due to nematodes (*Heterodera schachtii*), curly top, leaf spot (*Cercospora beticola*), and Phoma rot (*Phoma betae*), during the season of 1917.

(Table based largely on data from Offices of Sugar Plant Investigations and Agricultural Technology)

State	Production 1917 Quantity beets worked in factories. Short tons	Reduction in yield due to diseases							
		Nematode		Curly Top		Cercospora Leaf Spot		Phoma Rot	
		%	Tons	%	Tons	%	Tons	%	Tons
California	1,318,400	10.7	157,964	5	69,389	.5	6,625	No	data
Colorado	1,853,200	2	37,820	2	37,820	4	77,217	6	118,289
Idaho	329,800	0	0	.5	1,657	0	0	3	10,200
Michigan	596,500	0	0	0	0	No	data	No	data
Ohio	242,300	0	0	0	0	4	10,096	.5	1,218
Utah	776,400	15	137,012	0	0	0	0	2	15,844
Other states	1,120,500	0	0	.5*	5,631	1	11,318	2	22,867
United States	6,237,100	4.71	332,796	1.62	114,497	1.49	105,256	2.39	168,418
Other diseases, United States								1.35	95,219
Total loss due to diseases, United States								11.57	816,186

*No curly top east of Missouri River.

SUGAR BEET (Continued)

The estimate of the amount of injury from nematodes in California (10.7%) was arrived at from extensive data collected by Milbrath during the past season. The estimate is considered more reliable than any here given on account of the fact that it is based on actual determinations in many fields in all the important sugar beet areas.

PEACH

Estimated reduction in yield of peaches due to various diseases, 1917.

(Table based largely on data from Office of Fruit Disease Investigations)

State	Production 1917 Bushels 000 omitted	Reduction in yield due to diseases			
		Brown Rot		Leaf Curl	
		%	Bushels 000 omitted	%	Bushels 000 omitted
New Hampshire	47	-	-	10	5
Massachusetts	145	5	7	10	16
Rhode Island	20	5	1	10	2
Connecticut	268	8	23	4	11
New York	2,244	10	271	25	271
New Jersey	871	15	154	15	154
Pennsylvania	1,440	10	160	4	60
Delaware	647	20	162	1	7
Maryland	975	15	172	10	108
Virginia	800	15	141	5	42
West Virginia	608	5	32	8	53
North Carolina	1,541	10	161	3	48
South Carolina	1,130	20	282	1	11
Georgia	4,716	10	524	5	248
Florida	122	5	6	0	0
Ohio	496	15	87	10	55
Indiana	592	12	81	3	18
Illinois	364	12	50	3	11
Michigan	744	2	15	8	65
Iowa	30	-	-	3	1
Missouri	890	10	99	5	47
Nebraska	0	0	0	0	0
Kansas	121	10	13	3	4

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Kentucky	1,034	15	182	5	54
Tennessee	900	20	205	10	100
Alabama	1,830	20	458	3	57
Mississippi	375	25	125	1	4
Louisiana	478	25	159	0	0
Texas	2,352	2	48	2	48
Oklahoma	1,150	5	60	1	12
Arkansas	840	5	44	4	35
Colorado	1,200	0	0	0	0
New Mexico	60	0	0	1	1
Arizona	60	0	0	5	3
Utah	900	0	0	0	0
Nevada	6	0	0	0	0
Idaho	165	0	0	2	3
Washington	504	0	0	20	126
Oregon	250	.5	1	20	63
California	14,151	0	0	15	2,497
United States	45,066	6.27	3,731	7.12	4,240
Other diseases, United States				10.9	6,488
Total reduction due to diseases, United States				24.29	14,459

The reduction due to brown rot includes all losses previous to shipping and does not include those occurring in transit.